



SPARK GAP

Vol. 42, Issue 12, December 2025 *MARC - Serving Central Indiana Communities*

On Our MARC:

The M.A.R.C. Monthly meeting is this Saturday morning at 8:00AM at the Johnson County REMC in the Community Room. The location is 750 International Drive Franklin, IN. This is our annual Holiday Brunch so bring your favorite food to share with everyone there. We will also have a White Elephant Gift Exchange and you can use just about anything you want radio equipment, collectibles etc if you want to purchase a new item we are asking that you keep to value to about ten dollars. There is plenty of parking close to the building and please feel free to bring a friend with you.

..... Bob N9SIU, MARC Spark Gap Editor

CLUB DUES FOR 2025 - 2026

It is that time of year for your membership dues for the Mid-State Amateur Radio Club. The annual membership dues is \$25.00 per year and has not changed from last year.

This also a good time to update any of your information for club records such as license upgrade, change of address, contact information or call sign.

This is also a good opportunity for new amateurs to join our club and join in our club activities for 2026.

Please see Jacki Frederick, KI6QOG M.A.R.C. Treasurer.





DECEMBER BIRTHDAYS

KA9ZPA – Jose Vergara

KD9IJI – Brian Walls

KQ9Y – Chris Frederick

KE9DFU – Samuel Richardson

N9LLP – Rusty Kirts



Weather Observations

by KC9NJM

In December 2024, I wrote about what qualifies December 25th as a “White Christmas” in the U.S. As a reminder, the definition says that there must be at least 1” of snow on the ground at 7 a.m., local time, that day. Given that it only happens about 26% of the time in Indianapolis, this year’s early snowfalls has already stirred the hopes of some people that this year may finally produce one. Unfortunately, at this writing, it looks like Christmas Day will have a temp near the mid 40s and the possibility of rain.

If you are ever interested in looking at the historical weather conditions for past Christmases or for any of 27 other “holidays,” the NWS Indy staff has put together an excellent web page for your viewing. Titled “Holiday Stats,” the page can be found at https://www.weather.gov/ind/Climate_Holidays. The information found on the links there is extensive and covers dates from 1872 to 2024. Temperature highs, lows, and averages, along with information about the types, amounts, and percentages of precipitation, can be found for each holiday in any selected year. Its everything you wanted to know and more!

Just a reminder that there will not be a Weather Ops Webex session on Weds., Dec. 24th. We will resume our regular monthly meetings on Weds., Jan. 28th. I will send out a link in advance of that meeting and I hope that many of you will be able to join us.

As we wrap up 2025, it is my hope that each of you has a very Happy, Peaceful, and Safe holiday season. And if you’ve been nice, perhaps Santa will leave you some new radio gear, a weather instrument, or both, under the tree!

Sources: NWS Indy (www.weather.gov/ind)



January 24 – 25, 2026

<https://winterfieldday.org>

The Rise Of Lithium: How Lithium-Ion Batteries Are Powering Our Future

In the modern world, we rarely think twice about how the devices we use every day stay charged. Whether it's our smartphones, laptops, or electric vehicles, the backbone of modern life is often hidden beneath the surface—inside the batteries that power our devices. At the heart of this energy revolution are lithium-ion batteries, which have quickly become the standard power source for countless technologies.

But how did lithium-ion batteries come to dominate so many industries, and what makes them so special? This post will explore the evolution of lithium-ion technology, its key features, and how it's shaping the future of energy.

The Birth Of Lithium-Ion Batteries

The development of lithium-ion batteries can be traced back to the work of pioneering scientists in the late 20th century. While rechargeable batteries were not a new concept, lithium batteries introduced a step-change in performance. The breakthrough came in the 1980s when Dr. John B. Goodenough, a professor at the University of Oxford, discovered the potential of lithium cobalt oxide as a cathode material. His work, combined with the use of a lithium anode, enabled the creation of a battery that was lighter, longer-lasting, and far more efficient than its predecessors.

In 1991, Sony launched the first commercially available lithium-ion battery, sparking a new era of portable energy storage. This was a game-changer for electronics, allowing devices to become smaller, more powerful, and capable of holding a charge for longer. From that moment, lithium-ion batteries became synonymous with portable, high-performance energy.

Why Lithium-Ion Batteries Are So Special

So, what makes lithium-ion batteries stand out from other types of batteries, like nickel-cadmium or lead-acid? There are several key features that have contributed to their widespread adoption:

1. High Energy Density

Lithium-ion batteries boast a much higher energy density compared to other rechargeable batteries. This means they can store more energy in a smaller space, making them ideal for compact devices like smartphones, laptops, and cameras. The ability to pack a lot of energy into a small, lightweight package has been critical for the growth of consumer electronics and has allowed manufacturers to create sleek, high-performance gadgets.

2. Lightweight Design

Lithium is the lightest metal, which translates into batteries that are considerably lighter than their alternatives. This has made lithium-ion batteries the preferred choice for applications where weight is important, such as in electric vehicles (EVs), drones, and portable power tools. This advantage is particularly crucial in EVs, where reducing weight can improve driving range and overall efficiency.

3. Long Lifespan

Another key benefit of lithium-ion batteries is their longevity. Unlike older battery technologies that suffer from "memory effect" (where the battery loses capacity over time if not fully discharged), lithium-ion batteries can be recharged hundreds, even thousands, of times without significant loss of performance. This durability has made them the go-to option for devices that need to last, whether it's a phone that gets used daily or a car that's driven for years.

4. Quick Charging Time

In today's fast-paced world, time is of the essence, and lithium-ion batteries deliver when it comes to charging speed. Unlike older technologies, which could take hours to recharge, lithium-ion batteries can charge much more quickly, making them ideal for modern consumers who want to get back to using their devices without long wait times. This is particularly important in the growing EV market, where rapid charging technology is becoming an essential feature.

From Gadgets To Green Technologies: Lithium's Expanding Role

Lithium-ion batteries have made an indelible mark on a wide variety of industries. But beyond powering our personal gadgets, they are also playing a crucial role in transforming entire sectors.

Powering Consumer Electronics

It's in our smartphones, tablets, and laptops where most of us first encounter lithium-ion batteries. These devices would be unrecognisable without the performance provided by modern batteries. Thanks to their compact size and long-lasting power, lithium-ion batteries enable devices that are thin, lightweight, and capable of lasting all day on a single charge. This convenience has reshaped how we work, communicate, and entertain ourselves in the digital age.

The Electric Vehicle Revolution

The rise of electric vehicles (EVs) represents one of the most significant applications of lithium-ion batteries. As governments and manufacturers push for cleaner, greener transportation options, EVs powered by lithium-ion batteries are becoming an increasingly common sight on the roads. The key advantages of lithium-ion batteries, such as their high energy density and long lifespan, make them perfect for electric vehicles that need to store and deliver large amounts of energy efficiently.

Companies like Tesla, Nissan, and BMW have made substantial investments in lithium-ion battery technology, improving not only battery performance but also their cost-effectiveness. With advancements in charging infrastructure and battery chemistry, the electric vehicle market continues to grow, and lithium-ion batteries are leading the charge.

Renewable Energy Storage

As the world moves towards a more sustainable energy future, lithium-ion batteries are playing a crucial role in energy storage solutions. Renewable energy sources like solar and wind power are intermittent, meaning they don't always produce energy when it's needed. Lithium-ion batteries help to address this challenge by storing excess energy during periods of high generation, making it available when demand spikes or generation drops.

For example, systems like the Tesla Powerwall allow homeowners to store solar energy for use at night or during cloudy periods, offering more energy independence and reducing reliance on the grid. On a larger scale, lithium-ion batteries are used to stabilise national grids, storing power from renewables and ensuring a consistent supply of electricity.

The Future Of Lithium-Ion Batteries

While lithium-ion batteries have already had a transformative impact on our lives, there's still much more to come. Researchers and engineers are constantly working on improving the technology and overcoming its limitations.

Efficiency And Sustainability Improvements

One of the primary areas of focus is increasing the energy density and efficiency of lithium-ion batteries. In the future, we may see batteries that charge even faster, last even longer, and store more energy, making them even more effective for EVs, grid storage, and portable devices.

Additionally, as demand for lithium and other raw materials increases, there's a push to make battery production more sustainable. The mining process can be resource-intensive and environmentally damaging, so companies and researchers are working to develop more eco-friendly extraction methods and improve battery recycling. This is essential for reducing the environmental impact of lithium-ion batteries and making them a more sustainable energy solution.

The Power Behind Modern Life

Lithium-ion batteries have become indispensable in our daily lives. From powering our smartphones to driving the electric vehicle revolution, these batteries are at the heart of modern technological progress. As we continue to rely on portable energy and clean, sustainable power sources, lithium-ion batteries will undoubtedly remain a key player in shaping the future of energy.

As the technology evolves, we can expect even more breakthroughs, from faster charging to improved energy storage solutions. For now, lithium-ion batteries are truly the power behind modern life—helping us to stay connected, travel sustainably, and embrace a greener future.

Article by KCS Projects (<https://www.kcsprojects.co.uk/>)

Article source: <https://articlebiz.com>



FCC Allocates 60-Meter World-Wide Amateur Band Approved at WRC-15; Continues Amateur Use of Four Additional 60-Meter Channels, and Updates 420 MHz Coordination Information

The Federal Communications Commission (FCC) on December 9, 2025, released a long-awaited [Report and Order](#) adopting a new amateur radio spectrum allocation in the 60-meter band that was approved for world-wide use on a secondary basis in the WRC-15 (World Radiocommunication Conference 2015) [Final Acts](#). The Commission also agreed with a petition from [ARRL](#) The National Association for Amateur Radio® to continue to allow amateur operations on four existing 60-meter channels outside the international allocation with a full 100 watts. **The new rules will go into effect 30 days after publication in the *Federal Register*, when amateurs may then begin using the allocation.**

Specifically, the Commission allocated 5351.5 - 5366.5 kHz (60 meters) to the amateur service **on a secondary basis with a permitted power of 9.15 watts ERP**. The Commission also authorized amateurs to continue using four existing channels outside of the 5351.5 - 5366.5 kHz band centered on 5332, 5348, 5373, and 5405 kHz on a secondary basis with a permitted power of 100 watts ERP. There are no antenna restrictions but antenna gain must be used to calculate ERP.

The 60-meter allocation is available to amateurs holding a General Class or above license. The maximum permissible signal bandwidth is 2.8 kHz.

Amateurs are cautioned that this allocation is strictly on a secondary basis, and amateurs must avoid interfering with non-amateur stations using this spectrum. This obligation includes the responsibility to monitor for such stations using appropriate receiver bandwidths. The FCC emphasized that “allowing amateur operations in this band while fully protecting incumbent primary Federal operations is our priority, and even intermittent interference in this band could jeopardize important Federal operations.”

The Commission left open [ARRL's 2017 Petition for Rulemaking](#) to implement this WRC allocation (RM-11785), stating that “we expect the Commission may address any necessary power adjustments for the new 15 kilohertz international allocation in that proceeding.” ARRL will be observing operations in the new band to evaluate the effect of the 9.15-watt limit and already has been monitoring the regulations and experiences of amateurs in other countries.

Finally, in the same Report and Order, the FCC updated 420 - 450 MHz coordination and contact information for geographic areas where the peak envelope power (PEP) of amateur stations operating is generally limited to 50 watts. There was no substantive change to the areas covered by the power limitation.

Related ARRL News Stories..... December 2025





MID-STATE AMATEUR RADIO CLUB

The Mid-State Amateur Radio Club meets the **THIRD SATURDAY 8:00 AM** of each month
at the Johnson County REMC building 750 International Dr. Franklin, IN 46131
Everyone is welcome; you do not have to be a *HAM* to attend our meetings or a member of the club.
See our website, www.midstatehams.org, for maps on how to get to our meeting.

MARC OFFICERS

President	Tim Aldridge	WC9G	president@midstatehams.org
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W9MID Repeaters: 146.835 – (PL 151.4) Official SkyWarn Repeater for Johnson County
443.525 + (PL 151.4) YEASU SYSTEM FUSION (C4FM)

Weekly Net: Sunday evening 7:00 PM ARES members and ALL RADIO AMATURES
146.835/146.235 MHz (151.4 PL Input Tone)

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Please send your articles to my email: n9siu@yahoo.com no later than the 3rd week of the month.

Thanks to Johnson Co. REMC for the use of their building for meetings and testing.

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